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Editor of ORGANIC GARDENING

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TABLE OF CONTENTS

Vol. 6, No. 5 | April, 1945

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J. I. Rodale, Editor

Heinrich Meyer, Ph. D., Assistant Editor

Sir Albert Howard, C.I.E., M.A., Associate Editor

With The Editor—The Organic Forest 4

Two Potato Problems 10

Birds On The Farm 12

A Letter To Sir Albert Howard 14

Hints For The Victory Gardener 15

Seeds As Human Food 18

A Modern Herbal 20

Trampling Out The Vintage 23

Results 24

Reader's Correspondence 26

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With The Editor

The Organic Forest

THE time has come to deal with a question that has been hurled at us dozens of times. It goes something like this:

"If the theory of plant health is due to the proper cycle of bacterial life in the soil not being interfered with, how come the chestnuts were all swept out of existence, whether in yards, parks or woods? The Dutch Elm disease is taking trees in parks and woods. The woods are their natural place. The cycle of minerals, leaves, bacteria and humus is not interrupted. These trees should be healthy and yet they die. Why?"

Here is the same question in a different form appearing in a horticultural magazine:

"A fairly good answer to the claims of modern exponents of composting organic materials, that plants grown on soils without chemical fertilizers, are not bothered by insect pests, is the report of F. P. Keene, University of California in which he says "timber destruction by insects far outranks loss from forest fires, diseases and other causes. He claims that insects do from 100 to 150 million dollars worth of damage yearly to forest trees, killing nearly as much timber as is harvested and used."

There is indisputable proof that under man-made conditions of farming and gardening, the insect and disease problem can be controlled within more than satisfactory limits. In the forest, on the other hand, Nature cannot supervise every local situation, she cannot make individual decisions. She must operate through evolutionary, general principles. It is amazing how well this system works out, even though, here and there, failures do occur. And man seems to be ever ready to wantonly disturb Nature's elemental cycle in the forest.

In Michigan many years ago thousands of acres of woodland were completely cut down by short-sighted, commercial lumber interests. Soon the horizons were blackened by clouds of grasshoppers that seemed to spring up from nowhere. Apparently they were a by-product of these cut-over timber lands. I would not call it exactly a punishment for the infringement of one of Nature's laws. Rather let's call it the setting in motion by Nature of corrective measures to bring about the organic process of reforestation, a process in which the grasshopper may take his part. Unfortunately this insect wanders off to neighboring and sometimes distant arable lands and ruthlessly destroys grow-

ing crops possibly so that brush and trees can move in. This is a simple example of the fact that there *is* rhyme and reason in connection with the birth, growth and death of the forest.

Some naturalists and botanists talk as if Nature was personally vindictive, that she stands ready to smite with ruthless cruelty anyone who violates her organic principles. Nature does not waste precious time in deliberately punishing nor does she indulge in the human practice of worrying. She merely sets to work immediately to rebuild what has been destroyed, or undone. But man sometimes does not interpret her ways properly and thinks she is adding insult to injury. Let us try to understand her ways.

In Nature, unlike the farming activities of man, plants and trees are usually mixed. This thought has been admirably expressed by Dr. Ehrenfried Pfeiffer in *Bio-Dynamic Farming and Gardening* in which he states:

"An important factor in forestry is the question of monoculture versus a mixed stand of trees. With very few exceptions (for example, the oak) monoculture has shown itself to be harmful. In monoculture the roots of the trees take nutritive substances from the soil in a most one-sided way. The single crop has an unbalancing effect on the condition of the soil's acidity, and the falling needles or leaves produce only an unbalanced humus. If for example, only beech leaves fall to the ground, they bake together in time into a thick, impermeable layer, without mixing with the soil. The fertilizing effect of tree leaves is frequently not fully realized . . . . . "Forests of mixed trees produce a humus that has many components and is therefore loose, crumbly and not impermeable. The spread of harmful insects is checked. In short, we have here the most beneficial biological conditions and especially since the fertilizing of forests is not practicable, we need only allow the laws of biology to take their course."

The same thought has been expressed in the U. S. Yearbook of Agriculture for 1938 in which appears the statement:

"The general desirability of *mixtures* springs from the differences in ability of the species to extract nutrients from the soil and from differences in rooting habits. As an example, the soil under a shallow-rooted pine stand in Sweden was growing steadily more acid and biological activity was decreasing; the lesser vegetation indicated distinctly poor soil. After beech was *interplanted* among the pines the soil acidity decreased, biological activity increased, and the composition of the herbaceous growth indicated a much higher quality site. The roots of the beech were tapping a calcareous soil layer below the zone occupied by the pine roots and returning the calcium to the litter layer."

Man, in his farming habits, partly achieves fertility by rotating his crops. Nature in the forest secures similar effects "by maintaining mixtures of species in the stands." But when thoughtless or inexperienced individuals plant single crops of trees in the forest, troubles, diseases and insect pests may ensue. That is why in good forestry practice today we put hardwoods among pines and spruce. Science News Letter of Feb. 17, 1945 says in this respect:

"Some authorities even advocate the inclusion of such trees as wild cherry and hawthorn, which foresters used to term "weed trees," because they furnish food for game animals and birds."

The protective litter that the forest produces should not be disturbed. This is fertilizer needed by the trees. This point is beautifully covered in the same article in the Science News Letter mentioned above which states:

"Foresters in this country a generation ago were taught to admire and follow the lead of German foresters, who had been making and caring for forest plantings while we were still in the stage of wasteful exploitation of our own natural timber resources. Men who had visited the carefully cultivated woodlands in the *Vaterland* were loud in their praise of the orchard-like spacing and regularity of arrangement, with trees all of the same kind and age in blocks, so that all would grow up together and be ready for harvest together. They commented favorably on the table-like neatness of the forest floor, swept clear of dead branches, snags, stumps and debris generally. These were held up as models for the young profession of forestry in America. .....

..."Having all the trees of the same kind and age over large blocks tended to encourage epidemics of tree diseases and outbreaks of insect pests, that could sweep through the solid blocks without a break. When all the trees in a block were felled, too much soil surface was left exposed to the weather and consequent erosion, necessitating expenditure of much labor for protection."

Coming back to our main theme, is it possible for the forest to maintain a state of good general health, since it operates in an organic manner, without the use of the strong chemical fertilizers? Not always. As part of our organic scheme of operation in the garden or on the farm, there is need not only of organic fertilizer materials but also of natural cultural practices. There must be aeration of the soil, for example. Crops must be thinned out. In the forest, trouble develops sometimes when trees grow so well that they literally choke themselves out. Then disease and insect pests come. You cannot expect perfection in the forest because nothing gets individual attention. It is all part of a general scheme.

Among the cultural practices that Nature observes in the forest, that of *rotation* takes a prominent part. Where the farmer follows a five year rotation, the forest may work with a 200 or 300 year cycle. This is mentioned in the 1938 U. S. Agricultural Department Yearbook which discusses "often observed *successional trends in forests.*" This, they state is made necessary by the fact that trees have a "marked difference in their ability to extract nitrogen, phosphorous, calcium, and potassium from the soil." When certain species of trees have stood for hundreds of years and exhausted certain elements from the soil, other trees must replace them, trees that give the ground a rest as far as those elements are concerned. This was discovered in a series of experiments at Hudson Highlands, New York. Many old farmers today remember their grandfathers and great-grandfathers telling them that when they were boys, different trees would spring up than do today, when weedland was allowed to grow into wild woods.

When you read of spruce bud worms destroying thousands of square miles of forest, or that thousands of elms are dying in Ohio, or that oak wilt has appeared in Wisconsin, Minnesota, Iowa and Illinois, try to reconcile it possibly with Nature's scheme of forest rotation. The scientists seem baffled as to possible causes for these diseases, but it is a fact that forest

soils can lose their fertility just the same as farm lands, and thus invite disease and insect pests.

Many of the so-called virus diseases are due to soil depletion; this was observed with bananas in Central America, with tea in the East, and it is probably the source of such sudden epidemics as the apple scab which befell many Pennsylvania orchards despite the spraying routine. Nature speaks and overrules the chemicals, as in the orchard, so in the forest.

There is another important factor in connection with the life of the trees and the forest and that is its *ECOLOGY*. The dictionary says that *ecology* is the study of plants and animals with reference to their environment. If a tree is indigenous (native born or originating in) to the forest it may have a better chance of healthful survival. To give an example, in 1890 many imported trees, especially black locusts, were planted in New England. In the recent destructive hurricanes practically all of these imported trees were thrown down. The indigenous oaks and other trees remained standing.

Let us take another aspect of *ecology*. Some trees are trouble makers, like the spruce. It is a robber. It spreads rapidly and chokes out other trees. Another example in point is brought out by *CCC Forestry* (1937), published by the U. S. government: "Other trees have poisonous effects. It has been noted that often no vegetation except grass will grow beneath the *black walnut. Poisons given off by the roots of black walnut may be fatal to any woody vegetation with which they come in contact.*"

Then there are trees that were never meant to be in the forest, at all. They are absolutely out of place there. The chestnut is a glaring example of this. Naturally, it died out there.

On February 20 and 21, 1912 a chestnut blight conference was held at Harrisburg, Pennsylvania. All the chestnut trees in Pennsylvania forests had already died out. At that meeting, W. M. Benson, a manufacturer of extracts for tanning leather, gave a startling reason for the death of the chestnut trees in the forest. He said:

"In discussing the causes of the chestnut blight perhaps the past experience of the extract manufacturers who make extract for tanning leather, may be of assistance in pointing out the proper remedy.

"The chestnut wood received at the extract factories was at first supposed to be all alike in tanning strength, but costly experience proved that wood from good, strong lime, shale or limestone lands is far richer in tannin than wood from soils that are rocky, sterile, and which contain little lime. This difference is so marked that even the workmen in the leach house at extract plants can tell when wood from a lime shale or limestone region is being leached, simply by the unusual increase in the strength of the liquors obtained from such wood. Chemical analyses proved the same thing beyond all question, that in order for chestnut timber to attain its full tannin strength, it must grow on limestone or lime shale soil. This is not a secret of the extract trade, but a trade fact that extract manufacturers want the public to know, as it explains why the extract manufacturer will take wood from one region, but will refuse wood from some other locality, where analyses of the wood, and practical results in the leach house show a wide difference in the yield of extract per cord of wood. It pays better to pay freight for long distances to obtain wood

from a lime shale or limestone region, than to buy wood that is closer to the factory, but which has less tannin."

What Mr. Benson means is that forests in limestone regions are much less acid than those in other sections. But relatively speaking all forests are acid and as the chestnut must rob the soil of a tremendous amount of lime each year, eventually the land becomes extremely sour. State College tests showed that the ashes of the chestnut contained 40 per cent of lime, an unheard of amount. "A blighted tree," says Mr. Benson, "is simply a tree that is in the process of being starved to death for lack of lime."

Mr. Benson proceeds further:

"The map shown in this convention which outlined the area in which the chestnut blight is at its worst, shows the worst affected area to be in the vicinity of New York City, Long Island, portions of Connecticut, New Jersey, and Delaware. No doubt nearly all who attend this convention of the palisades of the Hudson, know how little lime such a weather resisting rock is likely to have. The sea sands of New Jersey, Long Island, and the clay soils of the Connecticut Valley, which are made up of the granite erosion of the White Mountains, all yield but little lime. Granite soils yield potash, but our analysis shows that our chestnut tree needs 120 times as much lime as potash. It was brought out at the convention that the place where the chestnut trees attained the greatest age was in Eastern Tennessee, where they grew to the immense size of six feet or more through. If you will take a geological map of Tennessee, and look at the rock formation in the region of Knoxville, you will be impressed with the large area of limestone and lime shale outcrops in that region. Please note that it was also stated in the Convention that there is no blight as far as is now known in the whole State of Tennessee. If trees can be shown there that are 500 years old and free from blight, growing on a lime shale or limestone soil, it will go far to support our supposition that the blight is not so much a dread disease that threatens to sweep away our native chestnut trees, as it is an evidence that blighted trees are merely trees that are starved for want of lime in the soil on which the tree is growing."

Subsequent to this time, the chestnut trees in Tennessee have died out also. They lasted longer there because the forests contained more lime than in Pennsylvania, New York and New England, but eventually they robbed away all of the available lime and then the blight struck.

The answer to the chestnut blight problem is that these trees must be planted in orchards, not in forests, and given treatments with compost as well as extra amounts of ground limestone. Here are Mr. Benson's suggestions for the application of lime:

"I would recommend that solutions of lime water be soaked into the ground thoroughly around trees known to be affected with the blight, and soak the ground around the trees as far as the branches above extend out. Soak the ground thoroughly for a distance of two or three feet down, so that every root big and little will get a little lime in solution in which shape it is readily taken up by the roots. The reason why I recommend lime water solution soaked into the ground, instead of scattering the lime around under the trees is this: It is known that the sap in blighted trees is sour; this sourness is not the natural sourness of tannic acid, but an abnormal sourness; therefore every

little fibre and rootlet must be fed lime to correct the sourness of the sap, and cause a normal healthy sap to flow or start this spring before the leaves come out. Lime scattered on the ground under the trees would do the same thing in time, but it would take months for occasional rains to soak the lime down to the roots."

It is a known fact that all fruit trees need liberal applications of ground limestone yet this is rarely mentioned in agricultural journals and books, and many of our orchard soils are very acid.

This article represents a mere opening of the general question of disease in the forest, which hasn't even scratched the surface of the subject. I hope our readers will take part in this discussion.

J. I. RODALE

Mulch To Conserve Soil Moisture

AN important function of a mulch often overlooked is that of conserving moisture. A mulch of leaves, grass or dead plant residues cuts down evaporation, helps to hold moisture in the soil and lowers the soil temperature. Sandy soils mulched with grass and leaves in November have shown 2 to 3 per cent more moisture the following May than unmulched soil. While this is a small amount, it is sufficient to make the difference between good plant growth and little or no growth on sandy soils. Plant roots extend down into the soil in search of moisture. In so doing, ordinarily, they grow away from the highest concentration of the mineral plant food elements. With a good mulch of organic matter the surface soil is kept moist, promoting the development of feeder roots near the surface of the soil and consequently in the zone of highest fertility. The improved moisture condition and increased plant food constituents result in increased vigor and better plant growth. A mulch will prove beneficial on heavy textured soils as well as on light textured ones, but the benefit from improved moisture conditions will be greatest on sandy soils.

A mulch can be recommended to decrease evaporation, transpiration losses by weeds, to insulate the soil against excessive heat, to supply available plant food and a source of humus. In addition, mulches afford practical nematode control on infested soils (see Press Bulletin 586). The conditions brought about and favored by mulches make their use highly desirable, especially on open, sandy soils common under Florida conditions.—Excerpt from Press Bulletin 602, called "Composting and Mulching"—issued by the Florida Agricultural Experiment Station, Gainesville, Fla.

Two Potato Problems

By SIR ALBERT HOWARD, C. I. E., M. A.

IN the cultivation of the potato in Great Britain two difficulties have to be surmounted. The first relates to the almost universal potato blight, the second to the running out of the variety. To keep this fungous disease at bay, it is necessary to spray or to dust the foliage with finely divided copper compounds like Bordeaux mixture. To overcome the running out of the variety—often a result of virus disease—two things have to be done: (1) fresh seed has to be imported every two or three years from Scotland, North Wales, or Northern Ireland, and (2) a constant stream of new varieties has to be created by the plant breeders.

All these difficulties involve the expenditure of much time and money. That it should be impossible for most of the growers of this crop to produce potatoes year after year from the same stock suggests that there must be something very much amiss somewhere in our methods.

Can these troubles be avoided? They can. If we first of all get the land into good condition by means of freshly prepared, high-quality compost, diseases like potato blight not only tend to disappear altogether, but a succession of heavy crops can be produced without any change of seed from outside and without recourse to new varieties.

In 1943 I visited Mr. John Tarves' garden at Heversham in South Westmorland where fine healthy crops of potatoes have been raised year after year on the same piece of ground for some forty-five years without any disease; without the use of poison sprays, and without recourse to change of seed from outside sources. Organic manuring by means of farmyard manure was always adopted.

A correspondent in Berkshire—Mr. Mark FitzRoy, The Rise, Mortimer, Reading—has just sent me an account of some experiments with potatoes in his garden as follows:

'May I take this opportunity of expressing my very great appreciation of all that you have taught. The following humble experiment has been my own effort to put your teaching into practice, and although the scale of operations was very small it may perhaps be of interest to you.

'The experiment was conducted on parts of a half-acre garden and orchard I have been making in a derelict grass field belonging to a ten-acre smallholding. After initial ploughing by the local W. A. E.C., all the work has been done by hand, and for the last three years by myself alone as a part-time job; hence the necessarily small scope of the trials. The soil is a "binding gravel", exceedingly stony, and at first was thin, sour, and infested with wireworm, which accounts for the low yields especially at the beginning. About half the turned-over turf was stacked for rotting, and the other half broken up on the surface. The variety of potato used was Majestic.

'No manuring has been given

other than a light annual dressing of Indore compost made with small quantities of farm-yard manure in bins similar to the New Zealand box and dug in with the weeds, and liming in autumn. After once "bastard trenching," cultivation was restricted to the top spit. No spraying whatever has been undertaken.

'The potato yield has slowly but steadily risen as the land improved, and crops of other vegetables have shown the same results; while pests and diseases have practically disappeared. The first potato crop suffered from blight, but without much damage to the tubers; subsequently there was no disease and no rotting in store. A legume-root-brassica rotation was practiced.

'In 1942 I saved 28 lb. of potatoes for seed and repeated this in 1943 and 1944 from the same stock. The increased yield thus obtained is shown in the following table:

	Weight planted	Weight lifted	Approx. Yield per 1 lb. of seed
1941—Bought seed	3¾ cwt.	15 cwt.	4 lb.
1942—Bought seed	1½ cwt.	6¾ cwt.	4½ lb.
1943—Bought seed	84 lb.	380 lb.	4½ lb.
Saved seed	28 lb.	182 lb.	6½ lb.
1944—Bought seed	28 lb.	142 lb.	5 lb.
Saved seed	28 lb.	212 lb.	7½ lb.

What is needed are more practical examples of this kind.'

A simple explanation of the above results can now be advanced. Each potato crop is an example of vegetative reproduction in which the proteins stored in the tubers help to give rise to new roots and shoots. To accomplish this effectively, such proteins must be properly and fully synthesized. For this, properly made humus is essential so that the circulation of protein between soil and sap is ensured. By this means one generation of potatoes follows the last without any loss in disease resistance or in reproductive power. But the moment we interpose in the nitrogen cycle a substitute phase in the shape of artificial manures like sulphate of ammonia for properly synthesized humus, trouble begins. The proteins are not fully synthesized. Disease resistance falls and the potato soon loses the power to reproduce itself.

Corn Salad

CORN SALAD got its name from being grown in the grain fields. For some reason or other, it has not obtained the firm foothold in this country which it deserves. We have tried to obtain some seed, but could not secure any. If any of the readers could spare a small amount, the editorial staff of Organic Gardening would be very grateful; we would like to grow some on our farms in Pennsylvania.

Birds On The Farm

By GEO. G. WILLIAMS,

Curator of Ornithology, Houston Museum of Natural History

EDITOR'S NOTE: Professor Williams is well-known among the bird experts as editor of a migratory bird journal. Our readers will make further applications of the ideas advocated by Professor Williams: Besides birds, there is the remedy of compost; there is also rotation of crops which does away with the most serious handicap of balance in nature, monoculture; there is finally the stimulation of healthy plant and tree growth by the use of organic, instead of chemical, fertilizers. The article, which goes well with the cover photograph, is particularly timely as a warning against spraying plants and trees at this time or any other.

"I've got to work night and day to raise a few vegetables and fruits in these times," complained the old man. "Unless I spend half my time and money on sprays, the insects get my crops before I do. What's happened to the world? When I was a boy things weren't like this."

"Well," I said, "what have you done besides spraying to help control the insects?"

"I've done everything!" he answered emphatically. "I've cleared out all the bushes along the fences so the insects wouldn't have hiding places, I've chopped the undergrowth out of my pasture, and I've burnt over all my waste lands. Why, I've even lain out many a day with my gun, shooting those confounded birds that rob me of what little fruit and vegetables I have left. I've tried everything. My farm is as clean as the top of your table—and still I raise less and less fruit and vegetables every year!"

Here was a situation that has been multiplied over and over on countless American farms. Industrious men like my old friend have gone to infinite pains to make their farms as unnatural as possible. Instead of trying to make their land fit easily, harmoniously, profitably into the natural scheme of things, they have tried to farm in the hard, unnatural, unprofitable way. They have not used Nature; they have fought her.

Long ago Nature worked out a plan for the adequate control of insects harmful to vegetation. The most important element (besides climate, of course) in this natural plan is—birds.

A single pair of House Wrens have been observed making over 1200 trips daily to their nest with insects for their young. It is a conservative estimate that a single pair of wrens, with their offspring, will destroy half a million insects in a season. Over 1,000 chinch bugs have been found in the stomach of one Flicker. A pair of Cuckoos (Rain-crows) will eat at least 10 feet of caterpillars every day, or 900 feet in a season of 90 days. Three pairs of small birds on an acre of land will destroy at least four ounces of insects every day; in an eight-month period this would amount to 60 pounds of insects taken off a single acre of land! Few sprays can do any better, and none are less expensive.

Figures like these, showing the value of birds as insect eaters and as prime factors in the control of various insect outbreaks at many times and places in America, could be listed almost indefinitely. As a

determined enemy of insects, birds have no equal.

It would be wrong to say, however, that birds can completely exterminate *all* insect pests that trouble the farmer, gardener, and fruit-grower. In the first place, along with our modern large-scale specialization in certain crops, certain insect pests peculiar to those crops have increased out of all normal proportions, so that no normal bird population could possibly control them. Next, the destruction of natural bird habitats and breeding places by the encroachment of cultivated fields has upset the primitive balance between birds and insects. And finally, the feeding habits of birds have always constituted only one part of a great, complex coordination of natural factors (such as climate, disease, parasites, and other predators besides birds) for keeping insect pests in check.

The point is this: Of all biologic agencies helping control insects, birds are doubtless the most effective. But they cannot do the job by themselves. On the other hand, where is any other control measure, whether chemical, mechanical, or biological, that is wholly effective in suppressing our insect enemies? Birds cannot carry the burden alone—but they are priceless allies.

There are about 1,400 species and varieties of birds in North America. Of this number, over half are of distinct economic value as insect eaters; and this figure does not account for those numerous additional species whose food is largely made up of noxious weed-seeds. Only two or three species of birds are generally detrimental to agriculturists of northeastern North America.

The Crow, of course, is the leading offender. Furthermore, many birds, on badly managed farms, will make local depredations on orchards and berry patches. The gardener should remember, however, that killing a valuable bird because it eats a few cherries is like throwing the baby out with its bath-water. The cherries are the wages the fruit-grower pays for the birds' help in destroying insects.

But, as a matter of fact, the small fruit-grower, if he would only work with instead of against nature, could easily and cheaply prevent nearly all damage by birds to his fruits. If he persists in the "clean-as-a-tabletop" kind of farming mentioned early in this article, he is certain to have difficulty; but if he will encourage native wild fruits (such as the birds are accustomed to and prefer) along his fencerows, and if he will plant a few mulberry trees on his farm, he will have little or no trouble from birds eating fruit.

In contrast to the few harmful birds, many hundreds are helpful. The familiar Meadowlark, Nighthawk, Chimney Swift, Cuckoo, Flicker, Kingbird, all the Swallows, Martin, Brown Thrasher, Catbird, Robin, Thrushes, Orioles, the native sparrows, and other common species do invaluable work. Moreover, all of them are attractive in appearance; most of them are friendly and interesting farm companions; and not a few of them are lovely singers. The agriculturist can't go wrong in protecting and encouraging them!

He should let native vines and shrubs grow along his fences for bird cover and bird food; he should permit undergrowth in his woods, and thickets in his pasture; he should leave cover for ground-nesting birds, and if possible protect them from the tramplings of cattle; he should plant a few mulberry trees to attract the fruit-eaters; he should use a few native plants as orna-

ments about his home—for the birds to nest and seek cover in; he should provide water for the birds in the hot summer months; in spring he may build a few artificial bird-houses to take the place of the hollow trees and dead branches that civilization has eliminated; and in winter he can have much pleasure and satisfaction by having a feeding tray for the birds.

All this is in line with the farm practice advised by the U. S. Department of Agriculture and by all other competent agricultural authorities. It makes city and country life more beautiful and interesting as well as more profitable.

A Letter To Sir Albert Howard

Copy of a letter to Sir Albert Howard from Mr. G. C. Dymond, Darnall, Natal, dated 20th May, 1944.

Dear Sir Albert:

Our Sugar Congress passed off very well—it might indeed have been better named the Compost Congress! I sent on copies of my contributions last week and Van Vuren will, no doubt, send you his most valuable paper.

During the course of discussion he told me the following extraordinary cases—the first two from a Doctor recently from England.

1. Certain plants which are grown in Switzerland for their alkaloid content have ceased producing alkaloids on a compost treatment—artificials being unprocurable.

I am writing Van Vuren for more details.

2. Rye grass has almost ceased producing Ergot under the same conditions.

3. In the Oudtshoorn or Long Kloof Valley of S. W. Districts, once famous for its ostriches, the lucerne (alfalfa) and clover crops apparently have ceased producing hydrocyanic acid at odd times. In the past this condition has resulted in stock deaths.

If this is true, what an immense field of research opens out.

While in the Cape recently I advised a jam factory on the conversion of the effluents, fruit peels, etc., into compost. As there is a sawmill close by, I suggested using the sawdust as an absorbent and filtering medium for their effluent.

Dr. I. S. Perold,
College of Agriculture,
Stellenbosch,

criticises my advice. He states that they know of no microorganism which is able to deal with the waxy material found in conifer sawdust. Such compost, he says, although fine in appearance, is extremely dangerous to use, as in some experiments it has been in the soil for two years without assimilation and with the retention of its waxy resinous character. He said it could be used as a medium up to 5-10%, but not more. On the other hand, Saligna Gum sawdust had no bad effects. Will you kindly advise me hereon?

I think I mentioned in a previous letter that a fruit grower friend of mine in the Cape with a 500-acre orchard spends up to £8,000 a year on sprays—principally for codling moth.

Yours very sincerely,
(Signed) G. C. DYMOND,
Chief Chemist—South African Sugar Co.

Editor's Note (We advise the use of not more than 5% by volume of any kind of sawdust in the compost heap).

Hints For The Victory Gardener

This is the twenty-ninth of a series of articles by this author dealing with the cultivation of ordinary vegetables.

EGGPLANTS

By ROGER W. SMITH

TO be complete, your Victory garden should include a few eggplants. The bad reputation of its relatives long caused this fine vegetable to be neglected. The eggplant, *Solanum melongena*, belongs to the same genus as the horse-nettle and the deadly nightshade; but many other solanaceous plants, the tomato, the pepper, the potato, etc., have very similar connections. The parsnip and the parsley have even more poisonous relatives.

In its wild state the eggplant is common in both South America and South Asia. In India the cultivated eggplant occupies about the same position that the tomato occupies in America. The eggplant has found favor in America only during the last century.

When first introduced the eggplant bore a white fruit about the size of a hen's egg—hence the name. Later popular varieties bore striped, yellow, purple, scarlet, and ash-colored fruits. Today, only the purple fruited types find favor.

The eggplant will thrive in almost any type of soil although it prefers a sandy loam slightly acid in reaction provided it is fertile, well-drained, and a rather heavy and steady supply of moisture is available. The use of raw manure should be avoided. Garden soil which is fertile as the result of former applications of compost humus is ideal. Probably your success with eggplants depends more upon your ability to arrange for an adequate supply of moisture than upon any other factor. But before arranging these matters you may decide to start your seedlings so that they will be ready when you need them.

Eight or ten weeks should be allowed for the raising of the plants. In March or early April seed should be sown indoors in properly drained flats, pots, etc. These should be filled with sifted, mature compost humus even though you have to bring it into the house in a frozen state and thaw it out.

The seed should be soaked in compost water for about twelve hours to improve germination. It should be thinly planted in the containers and covered with one half inch of clean sand to lessen chances of damping off of the seedlings. One ounce of seed should produce about one thousand seedlings. Many more than you will need but some of your neighbor-gardeners may welcome a few plants.

When the seedlings are about one inch high they should be given more room by being transplanted into individual pots, etc. After the growing of the seedlings has been taken care of you will prepare the place where they are to be set out when all danger of frost has passed.

The ground should be well dug and properly pulverized. When it has been levelled, about one inch of

compost humus should be well raked into the top two inches. A hole should be dug where a plant is to grow. This hole should be about the size of a wide-mouthed, two bushel basket. It should be filled with a fifty-fifty mixture of compost humus and clean sand and be allowed to settle. If your garden soil is excessively sandy you may find it advisable to omit the sand.

Not until the ground has well warmed up—so that it feels warm when you plunge your hand deep into it—should the plants be set out. They should be set in the places prepared for them so that they are slightly deeper than they grew in the container which produced them, be well watered with compost water, and be properly firmed by using careful pressure with one foot. A thin mulching with dry top soil applied after soaking will aid in preventing rapid evaporation.

The plants should be protected against unseasonably hot-dry weather for a day or so if necessary by shading them with inverted baskets, etc. Within a few days after the plants are set out they should be given a generous mulching of composted materials to extend at least a couple of feet around each plant. Later, this material will check weedy growth and do much to make the rich humus in which the plants have been set most suitable for healthy root growth. It will make of the area occupied by the roots a reservoir of easily accessible, nutrient-rich moisture.

The generous use of compost humus when setting out the plants and the careful maintenance of a fairly heavy organic mulch will make it an easy matter to meet the plant's demands for a heavy and steady supply of moisture. In addition, it will provide all necessary and natural nutrients. However, it may be sometimes necessary during unusual periods of excessive drought —unfavorable even to a plant of tropical origin—to supply additional moisture to maintain steady growth. In this case, it is best to remove the mulch and thoroughly soak the ground to a depth of at least two feet with compost water, preferably during the late evening. After the soaking, the mulch should be promptly replaced.

It is unlikely that either plant disease or insect pest will seriously bother your plants. Wilt is somewhat a problem in commercial plantings but has been largely overcome by the avoidance of lime and by the use of more acid soil; matters which you have taken care of by the heavy use of composted materials.

Since the eggplant has only recently been widely grown in America, your choice of types is rather limited. Black Beauty (73 days to maturity from the date of the setting out of the plants) and New Hampshire — good for northern planting—(60 days) don't offer much variety. But in the harvesting of their fine fruits you will doubtless take much pride.

How to know when the fruit is fit to harvest? In the stores you will see sunken, wrinkled, dull, and old-looking fruits. In your garden you will harvest only those fruits which have attained good size, which have a bright and glossy surface.

A half dozen heavy bearing plants, properly grown, should supply enough fruits to meet household demands. The Victory gardener's wife will doubtless be well acquainted with the many ways in which this vegetable may be prepared. However, you might like to note that the flavor may be much improved by stacking the slices like

hot cakes in a container and placing upon the stack a weight of two or three pounds. After an hour or two a considerable quantity of juice will have been expressed and with it any undesirable trace of bitterness will have been removed.

In the growing of a few eggplants you will meet a very fascinating vegetable. Scientists have found that wide inter-varietal crosses in eggplants are almost invariably sterile so any seed you save will likely run rather true to type. Eggplants have been caused to form parthenocarpic fruits by applying petunia pollen to the flowers. Microscopic inspection showed that the petunia pollen-tube failed to reach the eggplant ovule. The stimulus of the pollen alone caused the formation of the fruit.

But no matter what direction your interest in this fine plant carries you, whatever you learn by the cultivating of it, you may be sure that your success in its cultivation will depend very largely upon your ability to supply sufficient easily available, nutrient-laden moisture through the heavy use of mellow compost humus.

Food Reserve In Seeds

THE store of reserve-food in the seed on which the young plant depends for its early development is sufficient to enable it to form a root, stem, and several leaves, as is evident when seeds are allowed to germinate upon damp flannel or blotting-paper, from which nothing but water is absorbed.

No food-materials or manures are needed for this primary development, and seeds germinate and the seedlings grow for a considerable time as well in poor soil or sand as in good rich ground. As soon as the reserve store is exhausted hunger becomes apparent, and unless the plants are then supplied with suitable nutriment from the soil and air, and are also placed under conditions favourable for growth, weakness and death are likely to occur.

Among the larger seeds, such as beans and peas, where there is an abundant store of reserve-food, the young seedlings begin to manufacture food for themselves from materials absorbed from the soil and air, long before their reserve is exhausted. In small seeds the reserve is sometimes almost consumed before the roots and leaves are sufficiently developed to carry on their work properly, in which cases a more or less temporary starvation and check to growth ensues. Especially does this happen when seeds are sown too deeply, for a large amount of food is then used in the production of a stem long enough to lift the leaves up into the air.—*Agricultural Botany—By John Percival* (Duckworth-England Publishers).

Seeds As Human Food

By WALTER SIEGMEISTER, PH.D.

IN the beginning, according to Genesis, mankind was ordained to live on fruits, herbs and *seeds*. Why seeds were included in the human diet has only lately become clear to us. It is not the minerals, or the proteins or even the vitamins in seeds that make them essential in the diet. It is their content of fat, especially of phosphorized fats known as lipins, chief of which is *lecithin*, which makes seeds so important in the human diet.

It is claimed by some that the active minds of the Russians are due to their custom of consuming large quantities of sunflower and pumpkin seeds, since these supply lecithin which is a brain food. That the fatty part of seeds, which is expressed in their oils, feeds and strengthens nervous and cerebral tissues is a physiological fact, and from this results the value of seeds as foods.

Lecithin, which has recently entered therapeutics as a nerve reconstituent, is at present manufactured from the soya bean. However all seeds contain lecithin, which is intimately associated with the vital functions of the germ or embryo of seeds.

One of the most valuable seeds in human history is millet. Millet is one of the most ancient foods of the human race, and still constitutes the basic diet of teeming millions in Asia and Africa. From the hot tropics to cold Manchuria, millet constitutes the chief food of the natives. Recent scientific researches have shown that of all grains, millet is the only one capable of maintaining animals in a state of health when fed as an exclusive food, due to its high quality protein and complete vitamin content. On other grains, various types of nutritional deficiency result when they form the exclusive diet. But on millet perfect health is maintained, for millet supplies all essential amino acids and vitamins. Two and a half thousand years ago, Pythagoras, the first great teacher of diet in the western world, praised the nutritional value of millet and advocated its use. The Pythagoreans lived on a vegetarian diet composed of millet, vegetables and fruits.

Another seed that Pythagoras recommended is sesame. In Turkey and the Near East, sesame constitutes a basic part of the diet, and sesame oil is used as a source of fat in place of butter and other fats. Sesame seeds are made into a number of delicious confections, most famous of which is "Halvah". There is no reason why sesame should not be grown in our country on a large scale. Pythagoras recommended a meal made of sesame. Recently in the Andes, I have been given a delicious sesame meal made by Indians of toasted sesame seeds ground between stones with toasted barley. They make a similar meal of toasted linseed.

A great number of various seeds, now neglected, will be cultivated and made a part of the diet as soon as nutritionists realize the great importance of lecithin in the diet. In the past, proteins have been overstressed, while lecithin has been neglected. Yet it appears that leci-

thin is the most important missing dietary factor which most people lack, and of which seeds are the best source. Seeds such as pignolia nuts, pistachio nuts, cashew nuts (a seed of the cashew fruit, and not a nut), Indian nuts, etc. should enter into the diet, as should pumpkin seeds, sunflower seeds and sesame seeds. Seeds supply, besides lecithin, cephalin and lipositol (three phospholipins present in nervous tissue), the nutritionally essential unsaturated fatty acids (linoleic and linolenic), which Burr and Burr proved to be necessary for normal health and which are present in no other foods except in seeds and their oils.

Recently, much publicity has been given to a certain seed, the soya bean. However, from the nutritional viewpoint, the soya bean is by no means the most valuable of seeds, and other seeds, as sunflower seeds, sesame seeds, millet, etc. are superior. The reason why we say this is because the soya bean, with its 40% protein content, is often too rich in nitrogen for many people, who are unable to tolerate it, while all can eat the other seeds mentioned and handle them without difficulty, thereby obtaining their valuable lecithin content without the danger of an excess of protein, as when eating soybeans.

I predict that during the next few years, scientists will turn their attention to seeds and their nutritional value to a degree never done before. This will follow from the discovery of the great nutritional importance of the phosphatides, or phospholipins which seeds contain (such as lecithin), which are so important for the nervous system. As proteins and vitamins are emphasized in the past, so will the phospholipins, present in seeds, be emphasized in the future, and the cultivation and use of edible seeds will be given increased impetus. Already the increasing use of peanut butter is a sign that seeds are destined to occupy an important place in the human diet, and to take the place of the more expensive animal proteins, as meat, which are becoming scarcer and scarcer.

Old Maids And Clover

DARWIN pointed out, in an often-quoted paragraph, that there is a direct link between old maids in a village and the yield in clover-seed in the neighboring fields—old maids keep cats; cats catch field-mice; field-mice are enemies of the bumblebees and where their number decreases the bumblebees increase and the red-clover flourishes.—By Edwin Way Teale.—*Nature Magazine.*

Coals To Newcastle

A STORY is told of an agent sent to China to sell chemical fertilizers. After a period of inactivity, he received a cable from his firm asking him when they could expect orders to be coming forth. He replied ironically: "Trade impossible, with 400 million competitors!"—From *Utilization of Urban Wastes.* By J. P. J. Van Vuren, Proceedings of the 18th Annual Congress—South African Sugar Technologists Assoc.

A Modern Herbal

I. Introduction — II. Savory

By ROBERT O. BARLOW

I. INTRODUCTION

IT is the magic workshop of nature which we enter when we embark on the study of herbs, those fragrant plants with their infinite variety of aromatic oils that thrill our nose and tickle our palate. April is the month when most gardeners in our Northern latitudes look for the seed packages with dill and anise, thyme and parsley, or when they scan the magazines for advertisements from growers of plants. April is the month when they sprinkle lovingly the precious seed between their other vegetables or when they plant them carefully in a favorite bed already prepared. April is the month also when the frosts are over, when rosemary is taken up from the cellar where it was wintered to be placed again in the open in a new sunny spot. April is therefore the best time to think about the qualities of our herbs. What is their place in the kingdom of plants? What happens to give them these oils and spicy or pungent flavors and scents when so many other plants lack them? What is their value for our human systems?

These questions will be taken up gradually, one by one, as we discuss the fifty-odd herbs grown or growable in our gardens. It is common knowledge that plants containing volatile oils are as a rule warm-weather plants, sun plants, though some do like a moist ground also. Just the same, where the sap has oils and resins in it, it has a quality that makes the plant better withstand heat. Thus the sage brush country is a country of little rain; the eucalyptus country is dry and hot; and caraway does well in mountain meadows during hot summers. Yarrow settles readily on the vacant lot amidst cement and plaster from old houses.

These aromatic oils have definite health-giving qualities, either directly by stimulating our digestive juices as well as saliva flow and thus making digestion easier or by controlling bacteria that might be harmful in our intestines. The reason for using pepper, cinnamon, cloves, bayleaf is none other than to have the first effect of increasing digestibility; the use of oils to kill bacteria is well known from medical practice; the dentist uses oil of cloves, the druggist oil of peppermint, and the bacteriologist knows that such oils adversely affect bacterial growth.

These oils all have one thing in common: They are volatile, that is, they do not leave a permanent fat spot on paper, but evaporate. They are frequently tied in with resinous substances, as is turpentine, or with fatty oils. If rape seed, mustard seed, poppy seed and related or similar oil seeds are crushed they yield an oil up to fifty per cent of the original weight; now in radish and mustard, for example, this fat oil is combined with a volatile sub-

stance which we can smell because it is so fine that it is torn away from the fatty oil into the air. Most herbs have such an oil and therefore can be smelled, as a rule, without even being crushed.

The cultivation of herbs offers very little difficulty, but it is a known fact that peppermint varies both in quantity and quality of fragrance and yield according to the soil on which it is grown. In fact, different strains of mint have developed naturally according to their original home. This is not surprising: Everyone knows that hops, grapes, tobacco vary with the soil. The organic gardener has therefore good reason to wonder why our more common food plants are less seriously watched for quality than are these more specialized crops.

II. SAVORY

The first herb we shall investigate belongs to the mint family. The Latin name is Labiatae which means lip-shaped flowers. These little flowers grow on spikes and come out over a long period of time; in this way ample opportunity is provided for pollination; but the harvesting of mature seed requires waiting until fall. Among the members of this family are Rosemary, Black Sage, Sage, Horse Mint, Bee Balm, Stone Mint, Lavender, Thyme, Catnip, Peppermint, Pennyroyal, Japanese Mint, Basil, Horehound, Lemon Balm, Marjoram, Germander, Hyssop, Savory, an enormous family of fragrant oil producers!

We begin our investigation with Savory. The word is derived from Latin *satureia,* which Ovid, Plaute and others already mentioned as a herb. The Greeks called it *thymbra* and praised its kitchen qualities in many a book by nature-writers. Virgil too takes the Greek name and says in his book on agriculture that savory should be planted near the bee hive to give the bees access to its strong fragrance. Thus Apollo was called the Savory God because the bees were under his tutelage. When classical antiquity was received into the middle ages, especially through the care of Cassiodor and Benedict of Nursia, the great founder of the Benedictine order, Saint Benedict required his monks to read books; he thus established not alone scholarship, but the preservation of the learning of antiquity. Quite naturally, the entire cultural tradition of the ancients was thus preserved and the monastery gardens of the middle ages harbored the plants of which the old classic writers had sung and spoken. In this manner the Mediterranean plant Savory became acclimated to the North and found its way from the herb garden of the monk to every farmer's home. Ever since, it has spread and now it is so common throughout European gardens that it is hardly ever planted; savory seeds itself and comes up regularly every year.

When Savory was classified by botanists, both Linne and Jussieu gave it the ancient Roman (and present Italian) name of *Satureia,* while Moench distinguished within this species between *Satureia* and *Sabattia;* all of them classified the ancient *thymbra* as a different plant. Lamarck and De Candolle followed this classification in their *Flora of France.* At the present time, a new distinction is in vogue: Alpine, summer, and winter savory form three distinct groups. The second one, summer savory, has always been called garden savory too. The French botanists just mentioned call it *sariette des jardins,* while the Germans call it *Bohnenkraut* or *bean herb.* The French botanists say that it is "good for the stomach, it has a reducing ef-

fect, is a 'diuretic and a bit of a stimulant."

The small dark-green leaves scent strongly when they are merely brushed; the flowerlets, which come out in June and July, are of lavender color which varies at times with white or, at least, turns lighter after a short time. For use in the house, the plants are best gathered before flowering and preferably early in the morning when the fragrance is at its best. This is just about the time of year when string beans are ready for canning and cooking. Those who have not tried adding a sprig of savory to the beans in cooking, do not realize how the bean flavor is brought out by the addition of this herb. Whether the beans are eaten whole or sliced as a vegetable dish; as soup (with added rye-bread); as a salad flavored with raw onions; or canned for any of these purposes—savory should never be left out. The connoiseurs of beans know, of course, that a bean must be home-grown on fertile soil to have full flavor. The stringless varieties are stringless because they are picked young; but a string bean attains its real fullness of good taste only after it has developed strings; that is the stage when the seeds begin to thicken, but are still soft. The little labor involved in stringing is negligible when held against the enhanced nourishing value and the good taste that this bean contains; it is wise, however, to slice these beans into small slices, French style, to cook them with beef or in butter, beef fat or roast drippings, and to add a bit of browned flour and our sprig of savory. In this connection, the bean lover should also consider growing occasionally the Oriental fire-bean, *phaseolus variegatus*, which has scarlet as well as white flowers and is not a self-pollenizer to the extent of other beans, so that it readily lends itself to breeding experiments. It appears that the varieties carried in our catalogues as *Scarlet Runner* and *White Dutch Runner* belong to this species. The seed coats of the variegatus bean are black, white, brown, but usually purplish and lavender with blackish specks of irregular shape. A dish of cold bean salad made from these juicy, fleshy pods with some black pepper added in addition to the savory is just the right treat for the hot summer months. By the way, the savory sprigs are taken out before serving.

Like marjoram, savory is also mixed into sausages, especially meat sausage of either beef or pork ancestry. But we think that marjoram is preferable in this respect. We should perhaps altogether warn the reader, who has not as yet a wide practice or a long experience with herbs, that too much is worse than too little. Flavors must not stand out, flavors must barely be discernible; if a soup is salted to the extent that we can taste the salt separately, it is poorly cooked; the same is true of all other seasonings, including the herbs we grow ourselves. Likewise, we think that each herb should be reserved for a particular dish; put marjoram into sausage, reserve savory for the string bean! They are both of the same family, brothers and sisters even, they are both lovers of the sun, revealing thereby their Mediterranean origin; they should not be used in one another's place. It is nevertheless a most astonishing thing that savory is practically unknown among many gardeners. Those who have once tasted it will never wish to forgo its use; but even if they cannot use all the savory they grow, they will like it as they go along and weed their beds. A brush against a small savory plant makes weeding a pleasure, it opens a way into the mysterious labora-

tory of nature where from the same soil and the same air and the same sun so many different fragrances are produced by a different combination of the same elements of carbon and hydrogen; for that is about all that occurs in those oils. All, at least, that we know of . . .

Trampling Out The Vintage

J. A. Cocannouer, "Trampling Out The Vintage," University of Oklahoma Press, $2.75 (See our ad on page 30)

THE Publishers of Faulkner's famous book *Plowman's Folly* have brought out a new work that should become a bestseller. It is rare that one finds a great book on agriculture and gardening; Cocannouer, an Oklahoma farm boy, who established gardening schools in the Philippines, who visited China, grew fruit in California, and had perhaps a richer life than most other living men, not only wrote such a great book; he also gave a highly dramatic story of his life.

While the book advocates the very principles of organic gardening that we stand for, including even the Chinese recipe for making compost soil, it is not a technical work in the strict sense, but makes easy reading. We get to know and to like the author quickly.

Even as a boy he was observing; he jotted down his ideas and thought a giant pigwid growing in a potato patch would cause a hill to turn out a beter crop. He may have been right, for some plants do have a beneficial effect on others. To show his way of writing, we quote:

I remember one day in particular when we were sitting in what Carl called his junk shed. I was feeling very old and very responsible and very much in need of some new means of getting Carl out of the dumps.

"Carl, why in the name of black cats don't you ever haul that manure pile out on your fields?" I demanded suddenly. The manure pile was not far from the shed and just then seemed more taunting than it had ever before. "You've got enough manure in that pile to cover half your farm."

"I declare, Joe! I declare—I been plannin' to haul out that manure for three years. Just can't seem to get round to it. I doubt if it would do much good on this land, though —dirt's too poor to start with."—

Such little recollections throw an interesting light on the exploting tactics and the shiftless, careless practices of the people who ruined our virgin land, and left when it was depleted of the fertile topsoil.

The admirers of Sir Albert Howard will find in *Trampling Out The Vintage* much that will appeal to their sense of curiosity about the practices of the East, especially in China. Indore and Indang—there is an almost symbolic connection, one might say, between these Oriental names: The Orient as a teacher to the rustling white man's predatory shortsightedness! I do not like to use the word "inspiration", but I believe the readers will be enriched by this wonderful work and derive great satisfaction from meeting with its lovable author.

Meyer.

Results

If our readers find articles that strike them as having a bearing on our work, we shall be glad to have their ideas. *Send us the clippings* and write to the Editors of papers and magazines who fall down on organic principles.

If some of our Answers to Reader's questions seem poor or insufficient, be sure to write us and let us hear the voice of other experiences. Nobody is perfect and every gardener can and does make discoveries that should be communicated to others.

—o—

We have *never sprayed.* Birds increase.

H. M. Goldsmith,
Stoystown, Pa.

—o—

I am practicing this compost idea on my flowers and some tomatoes and I am sure there is a wonderful change in the *beauty of the flowers and the quality of the tomatoes.*

E. W. Hilsher,
Floral Hill Gardens,
St. Paul, Minn.

—o—

A club member helping with the bulletin noticed that after eating *a handful of sunflower seeds* each day for a month she was able to fold the bulletins without using her glasses, which she was unable to do a month before.

Health Education League,
Portland, Oregon.

Dr. Louis Long, Columbia 35, S. C., 86 years of age, writes us about a machine for leaf-grinding to make composting simpler. The idea sounds good. Perhaps someone has already constructed some machinery? There is a *field for inventors.*

—o—

Have never used commercial fertilizers, but am fortunate to get enough chicken manure; then I rake up all the leaves, add refuse from the garden and manage to get some earth mixed in by fall. I work on my pile during the winter; in spring it is ready for use. I have had wonderful results with flowers, vegetables, and berries. Last summer my neighbors and some farmers were complaining about everything burning up and the bugs being uncontrollable. *This made me smile* because I had such good results, and had not realized why until I got your booklet.

Sam Kite,
Lakewood, N. J.

—o—

Your magazine "ORGANIC GARDENING" I find very interesting as well as instructive—so many ideas new and different—and valuable too. I see so many things in a different light since I have been reading this little paper—am sorry to see the reduction in size.

Otis Lusby,
Denver, Colorado.

(We are sorry too that the paper shortage does not allow us to increase the magazine. But *we will as soon as the war is over.*)

I subscribe to ORGANIC GARDENING and like it very much. I own 5 acres in Milmay, N. J. on which *I would like to establish a subsistence homestead.*

Arthur C. Shimel,
Philadelphia 24, Penna.

—o—

We feel that you are performing a wonderful service to the American people with your experiments and research and publications, and if our subscription will help you in any way we are glad to continue it.

Moreover, I am deeply interested in each new issue as it comes, and read them avidly from cover to cover. I hope that later on when it is wise to make a change, *we may be able to put your ideas into practise,* as we have three small children and are very anxious for them to have excellent health from the very beginning.

Mrs. Russell Johnson,
Worcester, Mass.

—o—

Very much interested in your magazine and can recall in my boyhood days in Scotland, how the farmer stacked his compost in huge piles, on the fields and early in spring this was spread by hand while hot and plowed under.

I can also remember the wonderful crops of wheat, barley, rye, and oats.

I sometimes helped in picking up the potatoes and have yet to see crops like them.

I was not aware until now just how to explain it, but "Organic Gardening" is the answer.

Yours is a crusade, *and as you grow you will meet many obstacles.*

Robert W. Logan,
Daytona Beach, Fla.

—o—

Each year, the use of compost in my small garden shows increases in quantity and quality of vegetables. Parsnips, salsify, and Witloff chickory grew very large and have extra fine flavor. Peas are nearly always a failure in this section. A trench 15" wide and 12" deep filled with good *compost keeps my vines green and bearing* until mid-July.

W. W. McCartney,
New Haven, Conn.

Homely Okra's Value—A Lesson in Seed

FOR a century or so, Louisiana cooks have used Okra in their famous gumbo dishes. Okra is a relative of cotton, hollyhock, marshmallow, and the little weed we all know from childhood because we could play with its loaf-like seeds, the "cheeses". Dr. J. C. Miller investigated Okra for some time and decided to breed it for its seed. He found it not only rich in oil for industrial use, but also bred a strain that would yield up to 2000 lb. of seed per acre, with an oil content up to 440 lb. As if to confirm Editor Rodale's article in this issue, Dr. Miller states that the okra seed is high in food value. How important his experiments are, is apparent from the fact that Okra of his breeding has about three to four times more of valuable vegetable oil per acre than cotton seed.

Reader's Correspondence

Attention is again called to the rule that a stamped envelope should accompany every request. Some readers have become a bit slack. Due to the hundreds of questions which we have to answer, cooperation in this respect will save us postage and allow us to concentrate our resources on the main cause: *Organic Gardening.*

COFFEE GROUNDS

Q. Are coffee grounds bad for the earthworms?

Mrs. M. McDonnell,
Tacoma, Wash.

A. On the contrary. Earthworms love coffee grounds and use them, freely.

—o—

DAMPING-OFF

Q. What method do you use in planting seeds to prevent damping-off?

S. R. H.,
Schenectady, N. Y.

A. The Rodale farms never had any trouble with damping off, though we never used sulphurous matter to counteract the growth of the fungus responsible for the damage. After all, gardeners have raised plants for thousands of years without benefit of chemicals and without danger of damping off. If the soil is rich in organic matter, fungus growth will be properly regulated, the moisture responsible for the damping-off fungus will be absorbed and never become abundant, and the aeration is proper. Readers' letters have confirmed this fact repeatedly.

INSECT PESTS

Q. If one should not use sprays or insecticides to protect our gardens against the various pests, is there anything one *can* do while waiting for the compost material to bring the soil back to the point where pests will not be troublesome, to protect our Victory Gardens against cabbage worms, cut worms, wire worms and red ants, as well as against black and garden spiders. Add aphids and nematodes to this list, and you know what we are up against in trying to raise our own vegetables in our back yards.

Annie G. Harvey,
Fresno, Calif.

A. When you consider that mankind not only raised vegetables and fruit, but originally bred the varieties we now enjoy, long before the epoch of chemicals, you will agree with us that nature must have its own check against destructive pests. The best method of control is the encouragement of the natural enemies of the pests; lizards, toads, frogs, snakes are among the severest enemies of ants, sowbugs, etc. The spiders are very helpful in catching flying insects and should not be eradicated. And if no sprays are used, birds will come, from the charming humming bird on, and among the bird population of your

garden you will find your best helpers in controlling worms.

"Horticulture" magazine last year carried an item which related that in certain parts of Texas cutworms disappeared upon the application of chicken manure. Of course, the application of compost is far more effective than manure.

—o—

LAWNS

Q. Will you please advise me what I could do with the dirt in my back yard, I am planning to renew my lawn; the dirt is all dug up right now. I have about 50 feet for the lawn. The dirt is very light, just like ashes, and the grass does not grow nice at all.

Mrs. M. Weaver,
Chicago, Ill.

A. In order to get a good lawn, you should incorporate the old sod in your land. Whatever other vegetable matter is available should be used for making a soil rich in humus. While it would be best to put such soil in before you plant new grass, it is not too late to put a sprinkling of good soil over the land if new grass has already been planted. We also advise that you get some organic fertilizer of plant origin, like cotton seed meal, and apply it at planting time. In moist weather this will be rather malodorous for a day or two, but your grass should then take a firm hold and spread satisfactorily.

—o—

MUCK AND PEAT

Q. Can you tell me what difference exists between muck and peat?

Mrs. E. Clara Carson,
Chicago, Ill.

A. Your question about peat and muck deserves of a thorough answer since much confusion exists in this matter. Both substances are the remains of vegetation that has collected in swamps or otherwise moist localities under exclusion of air. The amount of organic matter in the form of carbons present is therefore greater than in any other comparable substance. The fertilizing value of both peat and muck depends to a large extent, first, on the plants which make up the substance and, second, on the amount of sand or clay mixed in.

By *peat* one properly designates the substance consisting largely of vegetable matter, while *muck* is either peat decomposed to such an extent that no stems, flowers, leaves, etc. can be recognized or peat which has become mixed with a great enough amount of soil particles to give it an earthy quality.

As a rule peat is more acid than muck, though the acidity depends both on the plant material from which the substance was originally formed and on the nature of the subsoil as well as the ground water. —In English books, *muck* may mean almost anything from manure to compost.

—o—

MOSSY LAWN

Q. My grass is dying and is being replaced by *moss.* I rake the moss out and plant more grass seed but it never grows. I would be thankful to you if you can help me to get my grass to grow.

Clarence A. Rodgers,
Indianapolis, Ind.

A. Whenever moss develops in a lawn, the indication is that the soil is becoming too acid for lawn grasses. Possibly this is due to excess moisture or shade.

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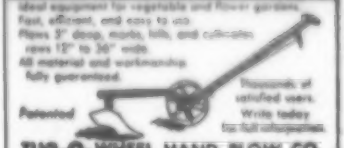

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The best way of counteracting the trouble is an application of limestone sprinkled over the grass. Then you want to add new topsoil, if possible of a rich organic nature. If you keep your grass cuttings and compost them with other vegetable matter, a bit of lime, some earth, and animal matter (manure, or dried blood, bone meal, etc.) as we advocate in our compost booklet, you will have just the right soil to put on top of your lawn. That should give the grass a chance to spread again.

—o—

SAWDUST

Q. Enclosed find analysis of decayed shavings and sawdust from basswood and buckeye. ("This material has a pH of 6.0, which is only slightly acid.") Can this be used in making a compost heap?

H. A. Smith,
Hendersonville, N. C.

A. It seems that you could use about 5% of your sawdust in compost heaps. The principle underlying composting is, as you know, the action of soil bacteria which break down wood fibers and similar substances for the use of the plants. It is therefore necessary that you sprinkle over the sawdust some earth, which always contains a certain number of such bacteria.

As a rule woody material is not recommended because wood is one of the most solid substances that outlasts all the ravages of weathering and organic attack. Thus, you should take care that you do not add too much woody material to your compost heap. But it is sound practice to make a layer of excess shavings on the ground where it will absorb the run-off from the heaps and thus gradually become predigested for composting.

KITCHEN DRAIN

Q. Our garden is on a terraced hillside. We are building a new drain to our kitchen sink. Would it be practical to let it drain into the "compost pile" at the foot of the garden? It would be tiled to the "pile" or pit made of cement blocks.

The pit has a pipe for overflow of water that will run into a tub or barrel that can later be used for watering plants that need it. Is this practical? Would there be enough fertility in this water to pay to carry it to the plants?

Mrs. Paul F. McCool,
Birmingham, Ala.

A. Not only do kitchen drains carry a goodly amount of fatty substances which are not easily broken down by soil bacteria and thus prevent the formation of good compost; there is another consideration: Since you could not adequately control the influx of water from the sink, the chances are that your pit would become waterlogged; inevitably, the nutritive substances, especially Nitrogen, would be leached out and lost to your garden.

As to watering plants with kitchen water, the fat particles are apt to cause trouble sooner or later, since the plants breathe through their many pores, called stomata or mouths, which would be clogged by fatty water.

—o—

LEMON RINDS

Q. How is one to know *if grapefruit and oranges are sprayed?* You say the skins can be used in compost, but you didn't say if it is wise to use *lemon rinds,* however I have used some.

With most every one using poison on everything nowadays, po-

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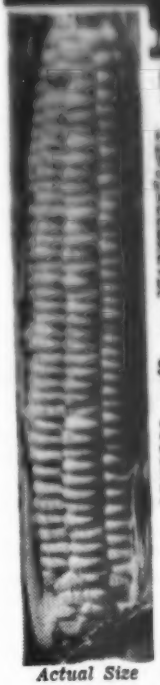

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tatoes, apples, cabbage, etc. and we who do not raise enough from our own gardens to can, should we just burn the potato peels, and leaves of cabbage, etc. and not run the risk of getting the poison in the compost?

Mrs. L. R. Wallace,
Yates Center, Kansas.

A. Citrus fruit orchardists usually resort to poison sprays. Experience has, however, shown that lemon and orange rinds, if properly composted, do not have unfavorable after-effects.

As you say, it would be desirable to use composting material free from metallic poisons and we hope that more and more people like yourself will become interested in organic gardening so that the final goal of healthful food can be more widely attained.

—o—

LIMESTONE

Q. Would too much lime have some disadvantage?

Albert G. Hettwer,
Scotts Mills, Oregon.

A. Your question about lime cannot be answered without a knowledge of the soil of your land. You had best watch the outcome and judge by the appearance of your crops whether you put enough lime in the land. There is, however, one consideration: Lime and potash are in a way competitors and an excess of lime may effect the maturing of the plants and the quality of the grain if there should be a potash insufficiency.

—o—

BREWERY HOPS

Q. Would you recommend *brewery hops for compost?* I ordered a load of hops that had been used in

brewing and composted them with pulverized sheep manure that I bought at a high price from a seedsman. Today I gave my pile its first turning. The manure had turned black, *but the hops still retained their original yellow color and showed no evidence of decay.* They still had the same bad odor that they had three weeks ago. I followed the directions in your compost book as best I could, except that I could not make the pile as high as it should be, for lack of materials. It was about 2½ *feet high to start with.* Both green matter and manure are extremely hard to get. It would take years for us to accumulate enough kitchen waste to start a compost pile. I thought the hops would be excellent for the purpose, but my experience seems to indicate that it will take a long time for them to rot. I was told by the brewery man that farmers who formerly had put brewery hops on their land had quit using them because *they made their land sour.* However, I used lime in my pile as your book directed.

William T. Bruner, Jr.,
Louisville, Ky.

A. Brewery hop can well be used for composting, if it is kept sufficiently wet to increase bacterial action. But as you know, hops are used to preserve beer and thus have naturally, even after use in the brewery, retained part of their bacteria-resisting quality. Still, no organic material resists permanently.

It is a must to have a height of about 4 or 5 feet, instead of 2½ feet. There would have been greater heat in the pile and the hops would have more easily disintegrated. You might be able to collect leaves and grass cuttings and even weeds from neighboring lots to increase the material to work with. Mixtures of green matter work best.

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CONTENTS

1 Introduction

Part I

The Part Played By Soil Fertility In Agriculture

2 The Nature of Soil Fertility

3 The Restoration of Fertility

Part II

The Indore Process

4 The Indore Process

5 Practical Application of the Indore Process

6 Developments of the Indore Process (A)

7 Developments of the Indore Process (B)

8 Developments of the Indore Process (C)

Part III

Health, Indisposition, and Disease in Agriculture

9 Soil Aeration

10 Some Diseases of the Soil

11 The Retreat of the Crop and the Animal Before the Parasite.

12 Soil Fertility and National Health

Part IV

Agricultural Research

13 A Criticism of Present-day Agricultural Research

14 A Successful Example of Agricultural Research

Part V

Conclusions and Suggestions

15 A Final Survey

Appendixes

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